

might have been removed from its situation in the lung. To have done this, it was necessary in the first place to ascertain its presence, and although the case was examined by some of the most eminent men of the profession, in different parts of the country, I have yet to learn that the presence of a foreign body in the lung was suspected by any one of them. The stethoscope disclosed nothing that might not have been reasonably anticipated from the general history of the case. The interesting *fact* is established by this case, that a foreign body may occupy a situation in the substance of the lung during a period of twenty-five years, without causing death. The right lung and the remaining portions of the left, were in a healthy state. The stomach was enormously distended, and its mucous coat very much thickened and corrugated. Its general appearance was very similar to that of the skin of the face. With the exception of a small patch of inflammation near the pylorus, it presented no indications of recent disease. The small intestines were healthy throughout their whole extent. The mucous membrane of the colon was thickened and corrugated in a manner similar to that of the stomach, and exhibited along its entire track, innumerable small ulcers, surrounded by blue elevated edges. No indications of recent inflammation. The other organs presented nothing abnormal.

ART. VI.—*On the Inability to distinguish Colours.* By PLINY EARLE, M. D., Physician to Bloomingdale Asylum for the Insane.

IN the European journals of science a number of cases have from time to time been reported of an inability accurately to perceive and discriminate between different colours, in persons whose visual organs, in all other respects, both of organization and function, appeared perfectly normal. In the *American Journal of the Medical Sciences* for August, 1840, Dr. Hays, in connection with his report of the unique and very interesting case of Mary Bishop, published the result of an analysis of these cases, by which it appears that there are several gradations in the extent of the defect in question. A philosophical arrangement is thus established which, being founded upon facts, must be permanent; although there is a possibility that future observations may modify it in some respects.

The object of this paper is, first, to report a number of cases which have come within the knowledge of the writer, and most of them under his own observation, but none of which have hitherto been reported; secondly, to substantiate and further illustrate some of the peculiarities attendant upon the physiological phenomenon under discussion; and, thirdly, to point out other peculiarities which, if heretofore observed, have not been mentioned

by any author whose treatise upon the subject has been examined by the writer.

§ 1st. *Cases hitherto unpublished.*

1. R. M.—An elderly gentleman who, for many years, and from conscientious motives, dressed in drab; but while all the other external garments were of this colour, his cravat was invariably red.

2. Z. G.—A gentleman who could not distinguish between red and green.

3. U. K.—A young man who, at the age of twenty-five years, first discovered that he could not discriminate between several colours. He thought that a bright scarlet tape exactly corresponded in hue with a steel-blue ruler.

4. * *—A preceptor of an academy in the interior of Massachusetts. At the time when it was customary to wear bows of ribbon upon the lower extremities of the pantaloons, he attended a *soirée* with red bows upon blue pantaloons.

5. Mrs. A., of the county of Worcester, Massachusetts. I have never seen this lady, but from anecdotes illustrative of her defective perception, I am induced to believe that there are but two or three colours which she can accurately distinguish.

6. C. D.—A gentleman to whom red, green, brown, &c., appeared identical. His defect was not discovered until he was nearly forty years of age.

7. J. W., aged 35 years. It is said that he can perceive but one colour in the rainbow.

8. J. M., of Salem, Massachusetts. I was passing a few weeks in the country, during the early part of summer, and this gentleman, at that time seventeen years old, stopped, with his sister, at the same place as myself. I one day accompanied him upon a long ramble, during which we arrived at a place abundantly prolific of the winter-green, the *Gaultheria procumbens* of the botanists. The berries were as numerous as the leaves, so that one would have believed that no person, unless he were remarkably short-sighted, could stand even at the distance of ten feet without beholding them in myriads. Being fatigued, we sat down in the midst of them; but I soon perceived that my companion in gathering them, was obliged either to place his head very near the ground, or take hold of the leaves with one hand and feel under them with the other. Yet his eyes were not myopic. Immediately suspecting that his difficulty arose from an inability to distinguish colours, I picked some of the leaves, both red and green, of the *Gaultheria*, and with these, the berries, grass and other leaves, made a series of comparisons and contrasts sufficiently apparent to ordinary vision, but they were all imperceptible to that of my companion.

Upon returning to the house, and when in company with his sister, I placed a bright scarlet bandanna handkerchief upon a green table-cover,

and asked him the difference in colour of the two. He asserted, most positively, that they were alike, to the utter astonishment of his sister, for neither she nor any of his family had ever suspected his defect.

9, 10. Two gentlemen, one in the city of New York, the other in one of the towns upon the Hudson river. They cannot distinguish between red and green. Farther than this, I am unable to describe their cases.

Besides these, *twenty-one* cases have come within my knowledge, a more elaborate notice of which will be given in another section of this article. The following account of one of them, written by the gentleman who is the subject of it, is more appropriately inserted in this connection.

"The general appearance of the rainbow, to me, is that of an object striped with three colours, yellow, orange and blue, gradually blended into each other, and themselves varying in their shades. I am unable to say whether, with a good prism, I could, using care, distinguish and mark seven distinct colours produced by it.

"As a general rule, however, it seems true that the difference between me and others, is more a want, on my part, of a quick and vivid perception of distinctions, rather than an absolute inability to discern them; for I rarely find two colours which appear different to others placed in juxtaposition, without my being able to perceive that they differ from each other. Yet the impression upon my mind is so imperfect, that, on seeing them again, at least, in some cases, I might be unable to give their respective names correctly. In some few instances, where colours are really different, perhaps I might not discern that difference if they were placed side by side. This, however, would be where the ground colour of both was the same, but one of them slightly tinged with red, such as pale blue and lilac of about the same depth of colour, or deep blue and violet.

"I can always distinguish correctly a full blue, a scarlet, or yellow, and generally orange, also, if near my eyes and examined with care. *I can discern yellow and blue of moderate depth at a great distance; but at any considerable distance I might not know whether a red was really a red or a deep green, brown, or olive.* I cannot, in general, know whether some olive cloths are really olive, or brown; but there are some browns that I can be sure of as being of that colour. *I cannot see red apples, or red cherries, or red strawberries, at any considerable distance, so as to distinguish them from the foliage; or, where I do distinguish them, it is not so clearly as I see the green ones.*

"Red, I think, appears brighter and plainer to me by candle-light, than in the day; so does blue, but yellow more faint than by daylight. I sometimes have mistaken a light green for a drab. The red which has some mixture of yellow is more vivid to my eyes, that which is crimson, or nearly so, resembles blue to some degree. Of the three principal colours, yellow is most distinct. All colours are agreeable to me, though I suspect red is less so than to people in general. Those red flowers which have a tinge of

either yellow or blue, are, I think, more pleasing than those which are of a pure red.

"In the vast variety of compound colours, where there is a slight predominance of blue over red, I am unable to tell which predominates, and, of course, am liable to miscalc the names. I find, however, that my perception of shades has improved by practice, *as it has of musical notes, in which I was deficient*, and I am disposed to think that, with application, I might perfect myself so as to be rarely mistaken."

Before proceeding to another section, it is proper to remark that of the *twenty-one* individuals whose cases are alluded to above, but *fifteen* are now living, and these are so widely scattered that it has been impossible for me to make a series of similar observations in their cases. I believe, however, that I am warranted in saying, that, in every instance, there was an inability to discriminate between red and green.

The irides of the person whose account of his own case is just given, are light, blue-mottled with white. Those of his brother, who has the defect, are blue with an imperfect band, or "ray," of a light bistre colour surrounding the pupil. Those of one of the two nephews of these men, who have the defect, are gray with a band around the iris similar to that just mentioned, though somewhat darker; and those of the other nephew are blue. In one of the cases published by Dr. Nicholl, it is said that the "eyes are gray, with a yellow tinge around the pupil;" and in a case recently reported by Dr. Boys de Loury, the irides were "light blue interspersed with yellow spots towards the centre." In one case that I have examined, the irides exactly corresponded with those last mentioned.

§ 2. Peculiarities heretofore observed.

a. *The inability to distinguish colours is hereditary, and*

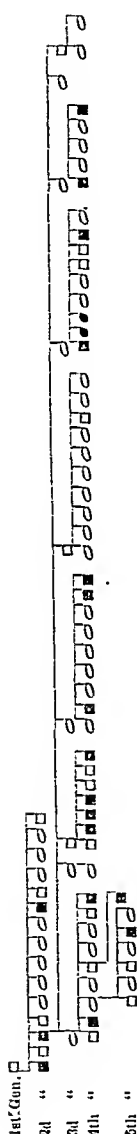
b. *When thus entailed, it sometimes overleaps one generation or more.*

c. *Males are more frequently affected than females.*

a. In several of the cases reported in foreign publications the truth of this proposition is demonstrated; but in none of their families did the peculiarity prevail so extensively as in that of which the author of this article is a member. My maternal grandfather and two of his brothers were characterized by it, and among the descendants of the first-mentioned, there are *seventeen* persons in whom it is found. I have not been able to extend my inquiries among the collateral branches of the family, but have heard of one individual, a female, in one of them, who was similarly affected.

For the purpose of clearly illustrating the prevalence of this physiological peculiarity in the family, I have prepared the subjoined genealogical chart. Males are represented by squares and females by circles. For those who cannot distinguish colours the squares or circles are wholly black.

The chart includes five generations. Nothing is known of the first generation, in regard to the power of perception in colours. In the second, of a



family consisting of seven brothers and eight sisters, three of the brothers, one of whom, as before mentioned, was the grandfather of the writer, had the defect in question. In the third generation, consisting of the children of the grandfather aforesaid, of three brothers and four sisters, there was no one whose ability to distinguish colours was imperfect. In the fourth generation, the first family includes five brothers and four sisters, of whom two of the former have the defect; in the second family there was but one child, a daughter, whose vision was normal; in the third there were seven brothers, of whom four had the defect; in the fifth, seven sisters and three brothers, of all of whom the vision is perfect in regard to colour; in the sixth, four brothers and five sisters, of whom two of each sex have the defect; in the seventh, two brothers and three sisters, both of the former having the defect; in the eighth there was no issue, and in the ninth there are two sisters, both of them capable of appreciating colours.

Seventeen of the persons in the fourth generation are married, and the whole number of their children is fifty-two. Many of the latter are very young, some of them not living, and as the defective perception has hitherto been detected in but two of the families, those alone are placed in the chart as the fifth generation. In one of them, consisting of three brothers and three sisters, one of the brothers has the defect, and in the other, a male, an only child, is similarly affected.

b. The overleaping of one generation by the hereditary peculiarity of vision, is satisfactorily shown by the chart; in which it appears, as has been mentioned, that there are no cases in the third generation. Furthermore, in the cases of the two males of the fifth generation, it will be perceived that neither parent nor grandparent had the defect; so that there was an interval of *two* generations between the manifestations of that defect.

c. That males are more frequently deficient than females, in the power of distinguishing colours, is manifestly confirmed by the cases mentioned for the first time in this article. These cases are *thirty-one* in number, *twenty-seven* of them being of males and but *four* of females. Of the twenty persons represented in the foregoing chart as having the defect, *eighteen*, or nine-tenths of the whole are males.

This disparity of numbers of those affected in the two sexes is no less strikingly exhibited by the ratio between the whole number of persons of either sex and the number of those who have the peculiarity. Thus, in the

chart, there are eight special families in which the defect prevails, one in the second generation, five in the fourth, and two in the fifth. These families include *thirty-two* males, of whom *eighteen*, or nine-sixteenths of the whole, have the defect; and *twenty-nine* females, of whom *two* or about one-fifteenth of the whole, also have it.

§ 3. *Peculiarities hitherto unnoticed.*

a. The power of accurately distinguishing colours varies at different times in the same individual.

b. The inability to distinguish colours is not unfrequently connected with, or accompanied by, a defective power of discriminating between musical notes.

a. In the man represented as the youngest of the first family of the fourth generation in the chart, it would appear that at times the function of the "organ of colour"—to presuppose the truth of an undemonstrated theory—were performed with nearly as great a degree of perfection as in persons who can make the most delicate chromatic distinctions, while, on other occasions, the defective action of that "organ" involves the individual in the most absurd mistakes. In describing a domestic fowl, he spoke of it as "the yellow hen with a blue tail," and, some years afterwards, being rallied upon the subject of his singular ornithological discovery, he declared that "if the tail was not *blue* it was *pink*."

It was evident that the colours which this young man usually confounds appear to him by candle-light much more nearly as they do to other people, than when they are seen by the light of the sun. The same is true in regard to red and blue, in the person whose account of his perceptive powers of colour is given in the foregoing pages. The explanation of this is probably found in the fact, that the light of our artificial means of illumination is much more yellow than that of the sun, and gives to the colours ordinarily unrecognized a certain degree of its own hue—a hue which is perceptible to all who have the defect, excepting such as come under the "worst degree" in the classification of Dr. Hays.

b. In the foregoing account, which is related in the language of him who is the subject of it, it is stated that the writer's perception of musical notes was "deficient"—I may add, from observation, that it was *very* deficient—but, as the writer observes, it has been improved by attention and practice. The whole family, of which the chart has been exhibited, is probably no less generally characterized by a defective musical ear than an imperfect appreciation of colours. Several of the individuals comprised in it are utterly incapable of distinguishing one tune from another. In some of the branches, however, where there was a high degree of musical talent *in the family of the other parent*, several of the individuals inherit it, and, among them, two who cannot distinguish colours. They are remarkably quick in "catching a tune."

A gentleman who has the general defect under discussion, and whose

case is included in the "thirty-one" herein mentioned, is a well-known professor in one of the metropolitan medical schools of the United States. In him, the total inability to discriminate between musical sounds is co-existent with the defective perception of colour. Notwithstanding the absence or imperfection of the powers mentioned, powers which it would appear are essential to the true poet, the poetical talents of this gentleman are such that, had he sacrificed unto them the truths of natural science, he might undoubtedly have attained a distinguished rank in that department of literature.

Another of the gentlemen whose case of defective perception of colours is herein noticed, is generally acknowledged as one of the first and greatest of American poets now living. He, also, is unable to distinguish one tune from another; yet his poetry is not deficient in the requisites of perfect cadence, harmony and rhythm. In regard to colour, his defect is such as is described in the "worst degree" of the arrangement of Dr. Hays. He says that previously to the time at which he ascertained this peculiarity of his vision, he always wondered that people should talk of "glorious sunsets," and "beautiful sunsets," inasmuch as he could detect neither "glory" nor "beauty" in them. The kaleidroscope of nature and the harmonicon of art are the Utopias of his mind. The magic hues developed by the prism, the iridescence of shells and minerals, the inimitable colours of the beasts and birds of tropical climates, the verdure of the fields of spring, the splendour of the autumnal foliage of the forests, the myriad-hues of flowers, and the realm of beauty which springs, as sprang Minerva from the brain of Jupiter, from the genius of the artist,—all these, it would appear, are, comparatively, "as a sealed book" to him. Yet from his writings no evidence of this can be detected. The poet throws his gossamer veil of ideality before the vision of the *man*, converting a sombre world into a paradise like that of the Persian. Seated upon the borders of Helicon, he looks abroad upon a universe transformed by imagination and glowing with all the colours of a phantasmagoria. The iris of heaven lifts its expansive arch in hues as varied and as vivid as when first placed there, "to establish a covenant" between God and man; the sun descends now invested with the mellow tints of the skies of Italy, and now surrounded by clouds emblazoned like those which attend its setting in America alone; fields are clad with a carpet of emerald, and flowers blossom with all the diversity of colouring that ever decked them in the gardens of the East; birds spread to the wind pinions as gorgeous as those that wave over the Amazon or the Ganges, and the mineral world glitters with the concentrated beauty of amethyst, topaz, beryl and all the precious stones adorning the foundations of the wall of the New Jerusalem which was revealed unto the apostle in Patmos.

This remarkable and apparently irreconcilable union of exalted poetical genius with an inability to distinguish either colour or tune, must be considered as one of the most wonderful of psychological phenomena. To

analyze the mind thus constituted would task the acumen of the phrenologists and the metaphysicians.

Before closing, I wish to direct attention, for a moment, to the question, "Whence arises the inability to distinguish colours?" There are persons who object to this proposition as being irrational and absurd. They maintain that there is no standard for the perception of colours, no criterion by which, in comparing the powers of two individuals, we are enabled to say which approaches the nearest to perfection, or which is the most nearly accurate. Indeed, they go further, and assert that there is no evidence of the identity or similarity of the impression of any colour upon the minds of any two individuals whose powers of chromatic distinction are considered perfect and normal;—that colour which is blue to the "mental vision" of one may be green, red, or yellow to that of the other; and so of any two colours whatever. Strictly speaking, the position of these objectors is true. No one can describe the mental perceptions which are received through the organs of vision, excepting by the use of conventional terms, the signification of which, as applied to the abstract nature and quality of the perception, may differ in the estimation of different individuals. Colour, considered only in reference to its existence in the mind, is ideal; and no one can "give colour to an idea."—Although A and B, whose perceptive powers are perfect in regard to colour, agree in calling a lemon yellow and the grass green, yet it is impossible to prove that to A the hue of the grass is not the same as that of the lemon to B, and *vice versa*.

No true philosopher, however, would resort to this argument. It is specious but unsound; and he who would rest upon it must inevitably become involved in a difficulty with reference to many departments of science, from which he could hardly extricate himself otherwise than by the subterfuge of the doctrine of Bishop Berkeley, that "all matter is ideal." It cannot be denied that certain rays of light, impinging upon the retina, produce an effect which, transmitted to the sensorium, whether modified or not in its passage through the optic nerves, gives an impression or perception of colour that the mass of mankind are consentaneous in calling "red."—As the anatomical structure of the organs concerned in the process, and also the functions of those organs are, if normal, identical in different individuals, it is rational to conclude that the results of their action will be the same.

The several theories promulgated by different authors as explanatory of the inability to distinguish colours may be resolved into two classes:

1st. Those which place the cause of the defect in the apparatus of vision; and,

2d. Those which suppose it to be in the organ of perception. We are disposed to give preference to the latter; but we have nothing upon the subject to add to the excellent treatise of Dr. Hays, further than to quote, without adopting its doctrines as the cause of the defect in question, the following extract from the *Annales Medico-Psychologiques*, for Jan., 1844.

"M. Chevreuil has shown that there is a harmony and a system of laws in colours as well as in sounds; that there are false colours, as there are false notes, which shock sensitive persons; and that there are some colours which, like certain notes, cannot accompany each other without proving exceedingly offensive." It is unnecessary, then, to regard the incapacity to distinguish colours as the result of an alteration of the retina, or of the optic nerve, but as often being the effect of a predisposition, natural or acquired.

ART. VII. *Dislocation of large joints reduced by power derived from twisted rope.* Communicated by D. GILBERT, M. D., Professor of the Principles and Practice of Surgery in the Med. Dept. of Pennsylvania College, Philadelphia.

EVERY practitioner knows that the reduction of luxations of the large joints cannot easily be accomplished without the steady, equable and continued traction furnished by the careful and patient use of the pulleys. These mechanical appliances often cannot be obtained when needed, in the treatment of such accidents; and the power resorted to then, is that which may be furnished by awkward and unskilful assistants. Under such circumstances, the efforts at reduction are protracted, unsteady, and, in most instances, unsuccessful; great force is applied by sudden starts and irregular jerks, which, with bleeding, warm baths and sedative medicines, exhaust the vital energies of the patient, probably without reducing the luxation; and cases are not wanting in which serious additional injury has been inflicted upon the parts concerned, by such procedures.

The power furnished by *twisted rope* answers every indication, requiring extensive power, as perfectly as the pulleys, and is indeed preferable on account of its simplicity and availability in every possible situation, enabling the surgeon even to dispense with assistance, should that be necessary. The credit of first using this power in such cases, is due to my friend P. Fahnestock, M.D., of Pittsburgh, Pa. He was led to its trial by necessity, and the result was so satisfactory that he has resorted to it in every case which he has met with since.

The mode of application is as follows:—place the patient and adjust the extending and counter-extending bands as for the pulleys; then procure an ordinary "bed cord" or "wash line," tie the ends together, and again double it upon itself; then pass it through the extending tapes or towel, doubling the whole once more, and fasten the distal end, consisting of four loops of rope, to a window sill, door sill or staple, so that the ropes are drawn moderately tight; finally, pass a stick through the centre of the doubled rope, dividing the strands equally by it; then, by revolving the stick as an axis or double lever, the power is produced, precisely as it should be in such cases, viz:—slowly, steadily and continuously, which, with the aid furnished by the surgeon to the immediate seat of lesion, and to the system in general,